

Huron County Nature Center Wilderness Arboretum

Observing Soil Samples

Lesson Plan

Level: 3rd - 6th Grade

Developed by Bob Tallman with funding support, in part, from the Huron County Nature Center

Program Description: Students will examine soil samples from different parts of the nature center using magnifying glasses. Activity will work best if one sample has a high sand content (from the old beach), one has a high clay content (woodland), and one has a high organic content (from a wet area).

MEAP Benchmarks:

SCI. V 1.Elem. 2: Recognize and describe different types of Earth Materials.
SCI.V 1. Middle 3: Soil determines surface changes over time.

Materials:

3 soil samples from the Nature Center
sheets of white paper
magnifying glasses
Screen sieves: 1/2" square, 1/4" square, 1/8" square

Key Vocabulary: sand, clay, silt, particle, organic matter

Procedure:

1. Spread the soil samples out on sheets of paper and examine them recording observations in the student's worksheet.
2. Students will observe soil samples with a magnifying glass and will identify the different colors, shapes, and sizes of particles

3. Students will recognize the difference between the organic and non-organic soil particles.
4. Stack the screen sieves with the largest screen-size on top. Pour the soil sample through the sieve stack. What is the mass of soil particles collected in each sieve
5. Add a small amount of water and see whether the soil will compact and stay together.
6. Students will compare and contrast the soil samples from different areas of the Nature Center

Huron County Nature Center Wilderness Arboretum

Observing Soil Samples

Student Worksheet

Overview

Most soils are composed of a variety of particles such as sand, clay, and organic matter. These particles are the result of rock weathering and organic material and are shaped by their transport in water, wind and ice. By spreading samples of soil out on pieces of paper and examining them with a magnifying glass, students can learn a great deal about what the soil is made of and contrast the differences between the samples. The properties of the soil particles the students will observe are color, size and shape. They will also identify the organic and non-organic particles.

Procedure

Spread the soil samples out on sheets of paper and examine them for the following:

1. Color

Dark colored soils usually indicate a high organic content. It may also indicate a poorly drained soil. A light colored soil usually indicates a high sand or clay content and a well-drained soil.

2. Size of particles

Are the particles larger or smaller than a grain of sand? Clay and silt are very small particles. Organic particles are usually large. Pour your sample through the screens starting with the largest. Weigh or measure the amount of soil held by each screen.

3. Shape of edges

The shape of the edges indicates the extent to which the particles have been worn down by various forms of erosion processes. Smooth particles indicate lots of wear, while rough, irregular particles indicate little wear.

4. Differences in the particles

How many different kinds of particles are there? What are the differences?

5. Organic matter

Is there evidence of organic matter? If there is, where would it have come from?

6. Living things

Are there living things in the soil? What are they?

7. Compacting

When soil is compacted and squeezed, it may or may not stick together. The way in which soil particles stick together gives us additional information about the types of particles present.

Make a “puddy” by mixing a small amount of soil and water in your hand. Try to form a “ribbon” of soil by squeezing your fist tightly closed. If the soil sticks together well, then the soil is mostly clay. If it sticks tighter moderately well, then the soil is a loam, a mixture of sand and clay. If no ribbon can be formed, then the soil contains mostly sand and broken rock pieces.

What is your soil like?

Extension

Have younger students draw a picture of what the soil particles look like.

Evaluation

Have the students contrast two different samples of soil based on differences in the particles.

Sources

1. Bergman, A., & Jacobsen, W. (1983) **Science Activities For Children**. New Jersey: Prentice-Hall Inc.
2. Sund, R., Tillery, B., & Trowbridge, L. (1973) **Elementary Science Discovery Lessons: The Earth Sciences**. Boston, MA: Allyn and Bacon,